be dispersed over the extended length L.

The length extension ratio of the connecting parts 210 to the bridge parts 190 should be preferably about 2.5~3.0 :1, and more preferably should be about 2.78 : 1. In this manner, any ruptures of the connecting parts 210 due to external impacts can be prevented.

To describe it in more detail, the length L of the connecting parts 210 between the supporting part 160 and the bridge parts 190 is set to 270~290μ m. Further the width of the connecting parts 210 is made to be larger than the width of the bridge parts 190, compared with the conventional case in which if the width of the bridge parts is 218μ m, the length of the connecting parts is zero.

Thus the stress which is imposed by an external impact can be dispersed, so that any ruptures of the connecting parts 210 can be prevented.

At the same time, the length of the bridge parts 190 is extended by 90~105μ m, and is preferably extended by 99μ m compared with the conventional length, thereby adjusting the resonance frequency variation which is caused by the extension of the connecting parts 210.

That is, the width and the length of the connecting parts 210 are extended, and at the same

time, the length of the bridge parts 190 are also extended, so that a resonance frequency same as that of the conventional crystal oscillator can be attained.

Under this condition, if the length L of the skewed connecting parts 210 is less than 270μ m, then a rupture-proof length of the connecting parts 210 cannot be obtained. On the other hand, if the length L of the connecting parts 210 is more than 290μ m, then the connecting parts 210 can also be easily ruptured.

FIG. 7 illustrates the quartz blank in another embodiment of the present invention. As described above, the width and length of the connecting parts 210 of the quartz blank 150 are extended.

At the same time, the length of the bridge parts 190 is made same as that of the conventional one, while the width of the bridge parts 190 is decreased by a ratio of about 1/8～1/9 compared with the extension of the length of the connecting parts 210.

Preferably, the width of the bridge parts 190 is decreased by 1/8~~,1~~ compared with the extension of the length of the connecting parts 210. To define it more specifically, when the length of the connecting parts 210 is 275μ m, the width of the bridge parts 190 is made to be 184μ m which is

| | | | | |
|---|---|---|---|---|
| Conventional example | Length and width of connecting part : 0 | 134(1.00) | 5.40(1.00) | 239(.100) |
| Example 1 | Length of connecting part: +99μm | 110(0.82) | 5.16(0.96) | 198(0.82) |
| Example 2 | Width of bridge part: - ~~0.0~~34μm | 91(0.68) | 5.24(0.97) | 154(0.64) |

The figures in the parenthesis are those for the case where the values of the conventional example are assumed to be 1.

As can be seen in Table 1 above, the rupture stress can be significantly reduced in both the first and second embodiments.

According to the present invention as described above, an insulating resin layer is formed between the quartz blank and the cover to elastically press down the conductive adhesive which is spread between the supporting protuberances and the quartz blank. Thus a shock absorbing effect can be reaped, and therefore, the ruptures of the connecting parts of the quartz blank can be prevented.

WHAT IS CLAIMED IS:

1. A crystal oscillator with ~~an~~ improved shock resistance, comprising:

an oscillator housing ~~main body~~ with a pair of supporting protuberances formed therein[;]; Paragraph a conductive adhesive being spread on the supporting protuberances;

a quartz blank having a ~~with its~~ supporting part bonded, via ~~onto~~ the conductive adhesive, on ~~of~~ the supporting protuberances;

a cover secured to the housing and positioned upon the quartz blank; and

an insulating resin layer placed ~~spread~~ between the cover and the supporting part of the quartz blank, for elastically pressing down the conductive adhesive.

2. The crystal oscillator as claimed in claim 1, wherein the insulating resin layer disposed upon the supporting part of the quartz blank is made of epoxy resin.

3. The crystal oscillator as claimed in claim 1, wherein the insulating resin layer disposed upon the supporting part of the quartz blank is also formed between ~~on~~ sides ~~parts~~ of the supporting part of the quartz blank and side walls of the housing.

4. The crystal oscillator as claimed in claim 1, wherein the insulating resin layer disposed upon the supporting part of the quartz blank extends along ~~is formed on~~ an

entire top surface and ~~on~~ entire side~~s~~ faces of the supporting part of the quartz blank.

5. The crystal oscillator as claimed in claim 1, wherein the insulating resin layer disposed upon the supporting part of the quartz blank partially covers ~~is formed on parts of the~~ a top surface and ~~on parts~~ each of ~~the~~ side~~s~~ faces of the supporting part of the quartz blank.

~~6. The crystal oscillator as claimed in claim 1, wherein the insulating resin layer disposed upon the supporting part of the quartz blank is formed only on entire sides of the quartz blank.~~

7. A quartz blank for use in a crystal oscillator with ~~an~~ improved shock resistance, comprising:

a supporting part;

a pair of connecting parts longitudinally extended from the supporting part; and

a pair of bridge parts each ~~elongately~~ extending from one of the connecting parts[,];

wherein a width of each of the connecting parts is greater ~~longer~~ than a width of each of the bridge parts[,]; and

wherein an outer longitudinal edge of each of the connecting parts consists of a parallel section ~~part~~ which is straightly extended from an outer longitudinal edge of the supporting part~~s~~ and a slant section slanted with respect to an outer longitudinal edge of the respective bridge part~~s~~.

8. The quartz blank ~~crystal oscillator~~ as claimed in claim 7,

wherein a length of the bridge parts is extended in proportion to a length of the connecting parts.

9. The quartz blank ~~crystal oscillator~~ as claimed in claim 8, wherein a ratio of the ~~a~~ length of the connecting parts to the extended length of the bridge parts is about 2.5 ~ 3.0 : 1.

10. The quartz blank ~~crystal oscillator~~ as claimed in claim 7, wherein the bridge parts have the ~~a~~ width as about ~~decreased by~~ 1/8 ~ 1/9 of ~~compared with~~ a length of the connecting parts.

11. A crystal oscillator with an improved shock resistance, comprising:

an oscillator housing ~~main body~~ with a pair of supporting protuberances formed therein ~~projecting within it~~, and a conductive adhesive spread on the supporting protuberances;

a quartz blank consisting of: i) a supporting part ~~for~~ being bonded onto the supporting protuberances by ~~across~~ the conductive adhesive; ii) a pair of connecting parts longitudinally extending from the supporting part; and iii) a pair of bridge parts each longitudinally extending from one of the ~~pair of the~~ connecting parts ~~respectively~~;

a cover ~~for~~ being secured to the housing and positioned upon the quartz blank; and

an insulating resin layer for elastically pressing down the conductive adhesive between the quartz blank and the supporting protuberances[.] ;

wherein a width of each of the connecting parts is ~~longer then~~ greater than a width of ~~each of~~ the respective bridge part~~s~~[.] ;

wherein an inside longitudinal edge of each of the connecting parts is straightly aligned with an inside longitudinal edge of ~~each of~~ the respective bridge part~~s~~[.] ; and

wherein an outer longitudinal edge of each of the connecting parts consists of a parallel ~~part~~ section which is straightly extended from an outer longitudinal edge of the supporting part and a slant ~~part slants~~ section slanted with respect to an outer longitudinal edge of the respective bridge part~~s~~.